

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Program in the Post Harvest Quality of Fruits and Vegetables

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms			10%	
202	Plant Genetic Resources			10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants			10%	
204	Plant Product Quality and Utility (Preharvest)			10%	
205	Plant Management Systems			10%	
206	Basic Plant Biology			10%	
501	New and Improved Food Processing Technologies			10%	
502	New and Improved Food Products			10%	
503	Quality Maintenance in Storing and Marketing Food Products			10%	
701	Nutrient Composition of Food			10%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	15.0	0.0
Actual	0.0	0.0	9.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	60827	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	52541	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	1011844	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Specific activities and outputs vary across a wide range from molecular level inquiry to field and lab based studies related to postharvest handling, storage, and processing of horticultural crops. These activities include: basic research that focuses on the application of molecular biology, genetics and biochemistry related to the biological, chemical, and physiological mechanisms that explain postharvest phenomena in horticultural crops; studies directed at the identification of controlled atmosphere storage regimes for apples and other fruits; investigation of flavor chemistry in apples; studies of the post-harvest/processing quality attributes of potatoes in the Tri-State Variety trials; research to identify factors that affect storability and processing quality of potatoes; research to identify improved strategies for storage of seed potatoes; research focused on the mechanical harvest and subsequent handling and storage requirements in asparagus; studies that address the use of microwave-vacuum drying technology for fruits and vegetables; studies that focus on lenticel breakdown and fruit finish in apples; and research that focuses on crop management factors that affect postharvest fruit and vegetable quality.

2. Brief description of the target audience

The target audience will be scientists in the area of post harvest quality of fruits and vegetables, agribusiness, economists, and the participating vegetable and fruit industries (in particular the stone and pome fruit industries, and the potato industry).

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	300	0	0
Actual	991	1600	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Plan: 1

Actual: 1

Patents listed

Knowles N., L. Knowles. Enhancement of potato tuber sprouting inhibitors using various combinations of agents. submitted. Application for provisional patent filed September 2, 2010. Registration No. 45,922

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	4	14	
Actual	1	26	27

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed journal articles

Year	Target	Actual
2010	13	26

Output #2

Output Measure

- Graduate students supported on Agricultural Research Center and external funding

Year	Target	Actual
2010	4	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Please see written paragraph under evaluation.

Outcome #1

1. Outcome Measures

Please see written paragraph under evaluation.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

Reversal of MCP-induced ripening inhibition in apples could potentially allow higher-quality fresh products to be available in the late storage season thus increasing international and domestic value of the Washington fresh apple crop. Studies described increase our knowledge of metabolic responses to the stress induced in the postharvest storage environment. Based on the results from the potato seed age studies, growers are altering the way in which they manage seed at the end of the growing season and throughout storage to maximize productive and economic value to commercial growers. Project findings have broadened the knowledge of stone fruit texture and its genetic control, for the benefit of the present industry as well as breeders and beneficiaries of future cultivars. Existing cultivars were characterized for their endoPG genotype to reveal underlying fruit type, resolve many ambiguous cases, and identify softening phenotypes controlled by genetic mechanisms other than endoPG allelic variation. This information is being exploited by industry, breeders, and researchers. The interaction of Stony hard with Freestone-Melting flesh is also better understood. The endoPG markers have proven valuable for identifying potentially useful functional genetic diversity in germplasm collections. The massive diversity detected for the endoPG gene in Prunus has important implications for fruit evolution and crop domestication in this genus, and represents much potential for genetic improvement of texture attributes in stone fruit.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms

202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
206	Basic Plant Biology
501	New and Improved Food Processing Technologies

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Decreases in state funding have significantly impacted our flexibility and operations although they have not led to overall program cutbacks at least partly because of our success in new funding programs.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

Key Items of Evaluation